

**Practice: 374 - Farmstead Energy Improvement****Scenario: #1 - Ventilation, Exhaust****Scenario Description:**

Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. Practice certification will be through receipts and pictures from the applicant. Typical scenario is replacement of old fan with 54" fan.

**Before Situation:**

Inefficient ventilation in an agricultural building.

**After Situation:**

High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$1,049.39

**Scenario Cost/Unit:** \$1,049.39

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	3	\$73.47
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1188	54 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$975.92	1	\$975.92

**Practice: 374 - Farmstead Energy Improvement****Scenario: #2 - Ventilation, HAF****Scenario Description:**

A system of fans are installed to create a horizontal air circulation pattern; the new system promotes efficient heat and moisture distribution. In a typical 10,000 square foot greenhouse, 10 HAF fans are needed. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

**Before Situation:**

Inefficient air circulation system in a greenhouse.

**After Situation:**

High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$188.88

**Scenario Cost/Unit:** \$188.88

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	2	\$48.98
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1189	High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$139.90	1	\$139.90

**Practice: 374 - Farmstead Energy Improvement****Scenario: #3 - Plate Cooler****Scenario Description:**

The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. Practice certification will be through receipts and pictures from the applicant.

**Before Situation:**

Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

**After Situation:**

High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure:** Each Plate Cooler

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$6,269.93

**Scenario Cost/Unit:** \$6,269.93

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	8	\$195.92
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1178	Stainless Steel, dual pass plate cooler with 750 - 999 gallon/hour capacity. Includes materials and shipping only.	Each	\$6,074.01	1	\$6,074.01

**Practice: 374 - Farmstead Energy Improvement****Scenario: #4 - Scroll Compressor****Scenario Description:**

Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor.

**Before Situation:**

Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

**After Situation:**

A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure:** Nameplate Power

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 5

**Scenario Cost:** \$2,583.43

**Scenario Cost/Unit:** \$516.69

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	4	\$97.96
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1183	Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only.	Each	\$2,485.47	1	\$2,485.47

**Practice: 374 - Farmstead Energy Improvement****Scenario: #5 - Variable Speed Drive, greater than 5 HP****Scenario Description:**

The typical scenario consists of a variable speed drive (VSD) and appurtenances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. attached to an electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. The motor size, on which the VSD is added, is larger than 5 HP.

**Before Situation:**

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure:** Nameplate Power of the Attached Motor

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 50

**Scenario Cost:** \$10,947.92

**Scenario Cost/Unit:** \$218.96

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	8	\$195.92
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	\$215.04	50	\$10,752.00

**Practice: 374 - Farmstead Energy Improvement****Scenario: #6 - Automatic Controller System****Scenario Description:**

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

**Before Situation:**

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulate the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure:** Each system

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$1,324.58

**Scenario Cost/Unit:** \$1,324.58

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	8	\$195.92
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$582.25	1	\$582.25
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	\$399.13	1	\$399.13
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$147.28	1	\$147.28

**Practice: 374 - Farmstead Energy Improvement****Scenario: #7 - Motor Upgrade, greater than 100 HP****Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 100 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure:** Nameplate Power of Motor

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 150

**Scenario Cost:** \$14,679.21

**Scenario Cost/Unit:** \$97.86

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	16	\$391.84
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1174	Premium NEMA approved electric motor, 100 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$7,064.85	0.5	\$3,532.43
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1175	Premium NEMA approved electric motor, 200 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$21,509.88	0.5	\$10,754.94

**Practice: 374 - Farmstead Energy Improvement****Scenario: #8 - Motor Upgrade, 10 to 100 HP****Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is equal to or larger than 10 and less than or equal to 100 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure: Nameplate Power of Motor****Scenario Unit: Horsepower****Scenario Typical Size: 50****Scenario Cost: \$5,851.49****Scenario Cost/Unit: \$117.03****Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	8	\$195.92
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1173	Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$5,655.57	1	\$5,655.57



**Practice: 374 - Farmstead Energy Improvement****Scenario: #9 - Motor Upgrade, 1 to 10 HP****Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure: Nameplate Power of Motor****Scenario Unit: Horsepower****Scenario Typical Size: 5****Scenario Cost: \$805.99****Scenario Cost/Unit: \$161.20****Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	4	\$97.96
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1171	Premium NEMA approved electric motor, 5 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$708.03	1	\$708.03

**Practice: 374 - Farmstead Energy Improvement****Scenario: #10 - Motor Upgrade, up to 1 HP****Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Scenario Feature Measure: Nameplate Power of Motor****Scenario Unit: Horsepower****Scenario Typical Size: 1****Scenario Cost: \$531.71****Scenario Cost/Unit: \$531.71****Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$24.49	4	\$97.96
<b>Materials</b>						
sites/NRCS_STcost/Lists/List_C omponentPracticeList	1169	Premium NEMA approved electric motor, 1 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$433.75	1	\$433.75